



greentechsolar:

Top 10 | Solar

Eric Wesoff: September 14, 2010

Update: Top Solar Venture Capital Investors

Solar VC investors sorted by style points and vision, not IRR.



Updated Sept 13, 2010

I missed a few quality solar investors and am taking this opportunity to add Applied Ventures, Good Energies, nth Power and Globespan Partners to the list.

Nth Power

Nth Power is one of the earliest VC investors in cleantech, with pioneering partners Nancy Floyd and Tim Woodward. They can actually boast funding and taking a solar company public with a VC-sized multiple before most of the players on this list even started investing in the sector (Evergreen). And they've chosen to avoid investing in thin film altogether.

- Cyanto: HCPV
- Evergreen Solar: silicon cells (public)
- Soliant: rooftop CPV
- Tioga Energy: commercial PPAs
- Xerocoat: AR coatings

Applied Ventures

Applied Ventures is the venture arm of Applied Materials and has nine publicly announced investments in solar.

- BT Imaging: solar metrology
- Enphase: Microinverters
- Fat Spaniel: solar monitoring
- Isil Energy: c-Si kerf recovery
- Kotak Urja: India-based solar PV and solar thermal
- Semprius: CPV
- Solaicx: solar ingots, acquired by MEMC
- SunEdison: solar PPA, acquired by MEMC
- Tera Barrier Films: encapsulation for flexible PV

Good Energies

It can be argued that Good Energies spearheaded the current era of VC investing in solar -- their investment in REC yielded what might be world-record VC returns. Good Energies has invested in at least 14 private and public solar firms.

- Agile Energy: utility-scale PV developer
- Enecsys: microinverters
- 6N Silicon: solar-grade silicon, bought by fellow portfolio firm CaliSolar
- Konarka: organic solar cells
- Q-Cells: cells, modules and systems
- ReSolar: grid connected solar farms in Italy
- Solar Century: residential and commercial solar across the EU
- SolarFun: China-based solar panel manufacturer
- Solar Reserve: CSP plus molten salt storage
- Xjet: inkjet-based deposition
- Endurance Energies: French solar developer
- Enviromena: developer of solar projects in Middle East and North Africa
- CaliSolar: high efficiency multi-crystalline silicon cells

Globespan Capital

Globespan Capital has five solar investments.

- Advent Solar: back contact solar cells (acquired by AMAT, although hardly a success story)
- Ampulse: thin fil c-Si
- CaliSolar: high efficiency multi-crystalline silicon cells
- Clean Cell: CdTe-based 3-D thin film
- Solar Power Partners: develops, owns and operates distributed solar
- Solar Silicon Technology: transforms low purity metallurgical silicon into solar grade Si

The braintrust at Greentech Media suggested I write an article on the top ten solar venture capital firms. Even despite what Sanjay said in this article.

As I started writing, I realized that the normal metrics for grading VCs -- IRR, quality of exits, etc. -- don't apply to today's solar investors, at least not in any meaningful way. The fact is that very little, if any, of the billions of VC dollars put into solar in the last few years have yielded the type of results that VCs look for.

You'd have to go back to SunPower, Suntech, First Solar, Evergreen Solar and GT Solar to cite solar firms that have yielded successful IPO exits. Those companies, save for Evergreen, were not funded by your standard Sand Hill Road-type venture firms. The Communist Party was Suntech's largest investor while members of the Walton Family sustained First Solar. T.J. Rodgers rescued SunPower with a \$750,000 investment (written on a personal check) in 2001 after the company got rejected up and down the valley.

There has been some M&A. Applied Materials has made some strategic acquisitions, as have Suntech, SunPower and First Solar. But few of those acquisitions were VC-funded, and few yielded the 10X returns that VCs bank on.

So, absent real financial metrics, I am free to list ten VC firms that invest in solar and select them for testicular fortitude, style points and sheer hype and vision.

Here we go:

Khosla Ventures and Kleiner Perkins as investors in Ausra, can certainly point to that firm's acquisition by Areva as an exit, if not on the order of Cerent. Ray Lane, a partner at Kleiner told me that they were going to let Ausra "get caught" in what amounted to a modest bidding contest for the concentrating solar power firm. Two, both firms are committed to solar and are putting their money where their mouths are by investing across the solar value chain -- and in KP's case, across early and late stages. Both Vinod Khosla and KP's John Doerr are thought leaders and vocal boosters for intelligent greentech policy.

Kleiner Perkins' solar portfolio:

- Alta Devices: Solar cells that aim to be 30 percent efficient at a module cost below 50 cents per watt; based on compound-semiconductors
- Amonix: Utility-scale concentrated photovoltaics
- Enphase: Microinverters
- Kotak Urja: India-based solar PV and solar thermal
- MiaSolé: Thin-film CIGS
- Solexel: 3D, high efficiency mono-crystalline silicon cell
- Sundrop Fuels: Solar driven gasification
- Solasta -- a-Si in a nano-coax structure (shut down)

Khosla Ventures' solar portfolio:

- PVT: Integrated system provides electric and heating for homes
- Cogenra (formerly SkyWatch Energy): solar technology that produces electricity and hot water.
- Stion: Thin-film CIGS

And this being KP and Khosla -- you can imagine that there are a few stealth firms not yet exposed to the sun. More on KP's John Doerr in an article later today.

VantagePoint Venture Partners

VantagePoint thinks big and they think long-term -- in solar and in their other greentech investments like Better Place. When the firm invested in BrightSource Energy, now a force in solar thermal power plants, they made sure they had the resources and the commitment from the start. They knew they'd need billions of dollars and prominent industry partners and EPCs like Bechtel. According to VantagePoint CEO Alan Salzman, their view is that the company has to scale and that "there's no cheap way to get to one gigawatt."

VantagePoint's solar portfolio:

- BrightSource Energy -- solar thermal power plants
- MiaSolé -- CIGS thin-film photovoltaics
- Senergen -- depositing silane onto free-form metallurgical-grade silicon substrates made via thermal spraying (shut down)
- SolarCentury -- EU-based solar integrator

The firm continues to look for more solar investments.

Firelake Capital

Unlike many VC firms that try to limit their exposure within any one particular technological field, Firelake has four investments in thin-film solar, two of which are CIGS. One of the 20 or so CIGS startups is going to figure this materials systems out and Firelake wants to back them. This shows perseverance and stubbornness in the face of reality, both excellent traits in an investor.

Firelake Capital's solar portfolio:

- Advent Solar: back contact solar cells (acquired by AMAT, although hardly a success story)
- MiaSolé: Thin-film CIGS
- NanoSolar: Thin-film CIGS
- Solexant: PV panels based on CdTe semiconducting nanoparticles

- Thin Silicon: Advanced thin-film photovoltaics

Quercus Trust

Quercus Trust is the investment arm of wealthy philanthropist David Gelbaum and gets a mention on this list by sheer profligacy. Here's a list of some of Gelbaum's solar investments in companies both private and public, credible and not-so-credible, with due diligence seemingly done with a Magic Eight Ball.

Quercus Trust's solar portfolio:

- 3G Solar: Israel-based dye solar cells
- Lightwave Power: plasmonics and photonic crystals
- Ascent Solar: flexible CIGS solar cells (publicly-held)
- DayStar Technologies: financially troubled CIGS PV module vendor (publicly-held)
- GreenRay: AC solar modules
- Emcore: triple junction solar cells for CPV (publicly-held)
- Applied Solar (formerly Open Energy): bankrupt BIPV
- Entech Solar: CPV (publicly-held)
- Spire Solar: solar manufacturing equipment (publicly-held)
- WorldWater and Solar: portable water pumps and irrigation systems powered by PV
- Sencera: amorphous thin-film silicon modules
- Nanoptek: solar thermal dishes that use the sun's energy to produce hydrogen
- Promethean Power: solar refrigeration
- Cyrium Technologies: III/V materials for CPV
- Akeena Solar: solar installer (publicly-held)
- Enviromission: aims to build a 1-km tower in Australia that will capture hot wind updrafts
- Nano Si Solar: particles for increasing the efficiency of solar cells
- RSI Silicon: solar grade silicon

Mohr Davidow Ventures (MDV) has a broad portfolio of cleantech investments, but only three solar companies in its portfolio that we know of. They're on the list because despite NanoSolar's current status, MDV's cleantech investors saw the potential for thin-film technology and had the vision of a printing model as opposed to a wafer model as the future of solar. The team recognized that early, long before the rest of the VC clan came around to that way of thinking. NanoSolar's future is uncertain but the vision of a disruptive solar manufacturing process via printing remains sound.

MDV's solar portfolio:

- Energy Innovations: HCPV
- Recurrent Energy: Commercial PPA provider
- NanoSolar: Thin film CIGS

Technology Partners makes the list by virtue of its selective eye and prominent public face. The cleantech partner at the firm, Ira Ehrenpreis, has been a vocal and ubiquitous champion of cleantech VC investing long before it was fashionable. The firm has chosen to co-invest with Kleiner Perkins in two potentially disruptive technologies, Alta and Solexel. And Ira has made an investment in Abound Solar, a cadmium telluride solar module company aiming to be "Second Solar." Abound is the recent recipient of a \$400M federal loan guarantee and looks to be scaling fast.

Technology Partners' solar portfolio:

- Abound Solar: cadmium telluride-based solar panels
- Alta Devices: Solar cells targeting 30% efficiency at a module cost below 50 cents per watt based on high-efficiency compound-semiconductor materials
- Solexel: 3D, high-efficiency mono-crystalline silicon cell

Rockport Capital and CMEA get demerits for their Solyndra investments, although we'll hail them as geniuses if Solyndra recovers. Rockport redeems itself with its early investment in microinverter firm Enphase, and CMEA gets a place on the list for its investment in Solaria, both companies that have a fighting chance of long-term survival in the bloodily competitive solar market.

Rockport's solar portfolio:

- Enphase: microinverters
- Evergreen Solar: financially challenged ribbon silicon solar wafer manufacturer (publicly held)
- Nanogram: laser reactive deposition process (sold)
- Satcon: large-scale solar inverters (publicly held)
- Soliant: rooftop CPV
- Solyndra: CIGS in glass cylinders
- Tioga Energy: commercial PPAs

CMEA's solar portfolio

- Solaria: low concentration PV modules
- Solyndra: CIGS in glass cylinders
- StealthCo: low-cost thin film

New Enterprise Associates (NEA) joins the list by virtue of volume. They've made at least 11 solar investments, some questionable (Konarka, Heliovolt) and some inspired (Suniva).

NEA's solar portfolio:

- 1BOG: solar aggregator, price negotiator and educator
- Astrowatt: thin silicon wafers, silicon-on-metal technology
- Azuray: microinverters

- Bandgap Engineering: nanowire-enhanced silicon
- Konarka: organic solar cells
- Heliovolt: CIGS solar panels
- Solar Junction: CPV semiconductors
- Skyline Solar: medium CPV with silicon
- Solar Storage: 24-hour enterprise-scale solar power
- SolFocus: CPV
- Suniva: high-efficiency c-Si

This is a subjective list and there are plenty of other investors making strong bets in solar (DFJ, NGEN, Battery, CalCEF, Bessemer, et al.). We'll be able to make a list based on real returns and true success and failure in a few years.